



THE SOLAR SHARE: An Edible Solar Currency

The Photon Harvesting in Plants and Biomolecules group collaborates with artists through the EU's S+T+ARTS in the City Artists in residency initiative

September 10, 2024

ICFO's [Photon Harvesting in Plants and Biomolecules](#) (PHPB) group led by Prof Nicoletta Liguori is part of the [Clean Planet program](#) at ICFO, exploiting the underlying physics of light interactions with matter to develop and implement renewable, clean energy technologies that can contribute to the mitigation of climate change.?

There are many pieces of this puzzle and the PHPB group utilizes experimental and computational tools to explore the regulatory mechanisms governing sunlight harvesting in photosynthetic organisms. They aim to deepen the fundamental understanding of natural photosynthesis in order to potentially uncover strategies to optimize the utilization of solar energy in photosynthetic organisms. In what they see as an urgent priority for the environment, the group is working to engineer photosynthesis for a more sustainable future. A challenge that led them to participate in the EU's [S+T+ARTS in the CITY initiative](#) which

brings artists into research centers through a residency program with the goal of enhancing art-driven innovation. The residencies take place over 9 months, allowing time for the artists, the host institutes and local experts groups, in this case HacTe (the Barcelona Hub for Art, Science and Technology), to converge and connect, followed by reflection and the development of the artwork

THE CHALLENGE: Understanding and Engineering Photosynthesis for a More Sustainable Future

How does photosynthesis function at the molecular scale, and can we improve it? Unveiling the processes governing light-harvesting regulation in plants and how we might possibly improve it, could advance sustainable agriculture. The PHPB group invited artists to support the scientific challenge of making plants even stronger allies in the fight against climate change.

Artists from [DISNOVATION.ORG](https://disnovation.org) took up the challenge, creating *1/2 THE SOLAR SHARE: an Edible Solar Currency*. This project challenges prevailing economic models with insights from sunlight-harvesting organisms, crucial to the metabolism of life on Earth. Staged as a one-square-meter microalgae bioreactor, the artwork foregrounds human energy dependence on photosynthesis and proposes harvested edible microalgae as a radical economic unit: The Solar Share. This unit is the biomass produced on one square meter of the Earth's surface that day. This edible algae unit is a photosynthetic proof of work that can be consumed, exchanged, or stored as a currency. The Solar Share is an invitation to experience firsthand a transformative economic model that reintegrates human metabolism and energy needs with the actual new energy entering the Earth system as photosynthesis. The Solar Share provocatively recenters Earth's metabolism in economics, redefining sustainability within planetary limits.

We were motivated to launch this challenge through S+T+ARTS to inspire conversations between researchers and society, in particular with artists that could help us find ways to not only explain to large audiences the importance of fundamental science, but also to put into much larger context the type of research that we are performing in our group. It has been an amazing experience, *1/2 reflects Liguori*

. The first showcasing of this artwork was at the ARS Electronica Festival in Linz (Sept 4-10, 2024)

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Credits

Conception & realisation: [DISNOVATION.ORG](https://disnovation.org)

Co-design: Katharina Ammann

Project assistants: Romain Theron, Leo Lima

Co-production: IFT Paris, Xcenter Nova Gorica, ART2M, and More-Than-Planet

The Solar Share was produced with the support of the S+T+ARTS program of the European Union, and co-commissioned by HacTe. It was inspired by the challenge «Understanding an engineering photosynthesis for a more sustainable future», launched by the Institute of Photonic Sciences (ICFO), and by the conversations held with the Photon Harvesting in Plants and Biomolecules research group (ICFO) during the research phase of the project.



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